

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
29 March 2001 (29.03.2001)

PCT

(10) International Publication Number
WO 01/21219 A2

(51) International Patent Classification⁷: **A61K 51/04**

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(21) International Application Number: **PCT/US00/25833**

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(22) International Filing Date:
21 September 2000 (21.09.2000)

(25) Filing Language: **English**

(26) Publication Language: **English**

(30) Priority Data:
60/155,061 21 September 1999 (21.09.1999) **US**

(81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

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(84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:

— *Without international search report and to be republished upon receipt of that report.*

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: **IMAGING OF DRUG ACCUMULATION AS A GUIDE TO ANTITUMOR THERAPY**

(57) Abstract: The present invention describes the use of radio-labeled antitumor drugs in the treatment of solid tumors by the method of administering a radio-labelled anticancer drug to a patient and imaging at least a part of the patient using Positron Emission Tomography imaging. The method is used to monitor delivery of antitumor drugs to tumors and may be used to predict the effectiveness of therapy with a particular antitumor drug or combination of antitumor drugs, to assess the effectiveness of modulators of cellular accumulation, to individualize therapy and to evaluate the effectiveness of antitumor drugs with respect to particular cancers. Particularly preferred drugs are labeled taxanes, e.g., ¹¹C-paclitaxel and ¹¹C-docetaxel, labeled anthracyclines, e.g., ¹¹C-doxorubicin and ¹¹C-epirubicin, and other radio-labeled drug, e.g. ¹¹C-topotecan and ¹¹C-mitoxantrone. The invention further describes antitumor drugs labeled with the radioactive label ¹¹C and methods of preparing radio-labeled drugs.

WO 01/21219 A2